

METHOD OF DEPOSITING SILICON WITH HIGH STEP COVERAGE

Abstract of the Disclosure

A method is disclosed for depositing silicon with high deposition rates and good step coverage. The process is performed at high pressures, including close to atmospheric pressures, at temperatures of greater than about 650°C. Silane and hydrogen are flowed over a substrate in a single-wafer chamber. Advantageously, the process maintains good step coverage and high deposition rates (e.g., greater than 50 nm/min) even when dopant gases are added to the process, resulting in commercially practicable rates of deposition for conductive silicon. Despite the high deposition rates, step coverage is sufficient to deposit polysilicon into extremely deep trenches and vias with aspect ratios as high as 40:1, filling such structures without forming voids or keyholes.

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